

## Thermal Pyrolytic Graphite Enhanced Components, Phase I

Completed Technology Project (2008 - 2008)



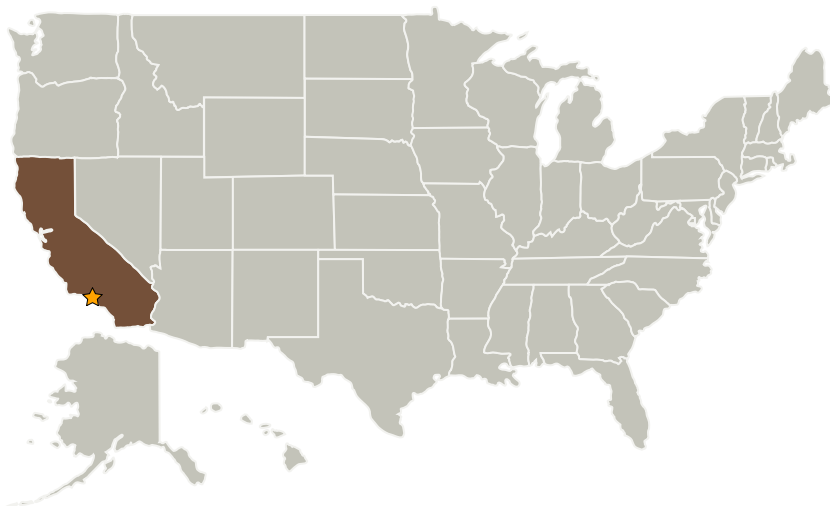
## Project Introduction

Peregrine's innovation will reduce the required input power, increase a coolers systems margin for a given cooling load and reduce vibration accordingly for Reverse-Brayton Cycle Cryocoolers. Our innovation will enhance the thermal conductivities of structures associated with the cryocooler, enable much more efficient heat removal and thereby produce a much more efficient system. Effectively we will be increasing the thermal conductivities of the structures associated with the cryocoolers by embedding Thermal Pyrolytic Graphite within a matrix of material to produce a thermal conductivity 3 times higher than current available materials. At the end of Phase I Peregrine will have demonstrated the feasibility of our innovation and laid out a detailed design and test plan for Phase II. At the end of Phase II Peregrine will have produced a flight like product tested for future satellite applications. Phase II will also incorporate characterization of the material and engineering guidelines. As cryocooler technologies attempt to cool components down around the 4

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K level waste heat and the management thereof becomes critical to the performance of the cryocooler. Thermal conductivity structures that can eliminate thermal loads more effectively will lead to a more efficient and better performing cryocooler.

## Primary U.S. Work Locations and Key Partners



Thermal Pyrolytic Graphite  
Enhanced Components, Phase I

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Jet Propulsion Laboratory (JPL)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
The Peregrine Falcon Corporation	Supporting Organization	Industry	Pleasanton, California

## Primary U.S. Work Locations

California

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Robert Hardesty

## Technology Areas

**Primary:**

- TX14 Thermal Management Systems
  - └ TX14.1 Cryogenic Systems
    - └ TX14.1.3 Thermal Conditioning for Sensors, Instruments, and High Efficiency Electric Motors